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New abyssal species of the genus *Macrostylis* G.O. Sars, 1864 (Crustacea: Isopoda: Macrostylidae) from the northwestern part of the Indian Ocean

Новые абиссальные виды рода *Macrostylis* G.O. Sars, 1864 из северо-западной части Индийского океана (Crustacea: Isopoda: Macrostylidae)

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КЛЮЧЕВЫЕ СЛОВА: Isopoda, *Macrostylis*, новые виды, абиссаль, Индийский океан.

ABSTRACT. Illustrated descriptions of four new species of the genus *Macrostylis* G.O. Sars, 1864 are given.. The material was obtained from collections of R/V "Vityaz" on two stations in the northwestern part of the Indian Ocean.*M. confinis* sp.n. (17°35′N, 64°09′E; 3617 m) is closest related to *M. amplinexa* Mezhov, 1989, and differs by a more elongated body without setation, elongated pleotelson, shortened spines on sternites IV–VII, proportions of the articles of antenna I, less produced lobe of the ischiopodite of pereopod III. *M. medioxima* sp.n. (8°21.2′N, 56°17.4′E; 4458 m) quite distinctly differ from close *M. capito* Mezhov, 1989 and *M. amplinexa* Mezhov, 1989 by a weaker setation of body, absence of spines and presence of a medial keel on the sternal surface of the anterior pereon division. *M. prolixa* sp. n. (8°21.2′N, 56°17.4′E; 4458 m) somewhat resembles externally *M. urceolata* Mezhov, 1989, but differs by the comparatively broadened body, rounded to rectangular pleotelson, spines on the sternites IV and V, relatively short antenna I with a smaller number of aesthetascs, short antenna II, narrower epipodite of maxillipede, massive lobe of the ischiopodite of pereopod III, practically direct exterolateral margin of pleopod I, narrow protopodite of pleopod II with more numerous distal bristles. *M. minuscularia* sp.n. (17°35′N, 64°09′E; 3617 m) is rather closely related to *M. sensitiva* Birstein, 1970, from which new species differs by a comparatively small size, a more elongated body, elongated head, broadened distally pleotelson with the strongly shortened mediodistal lobe, other proportions of articles of the antenna I, structure of pereopod III and a relatively narrow and blunt distal protopodite of pleopod II.

РЕЗЮМЕ: Публикация содержит описания четырех видов рода *Macrostylis* G.O.Sars, 1864, ранее не известных науке. Материалы получены из сборов э.с. "Витязь" на двух станциях в северо-западной части Индийского океана. *Macrostylis confinis* sp.n. (17°35′с.ш., 64°09′ в.д.; 3617 м) наиболее близок *M. amplinexa* Mezhov, 1989, а отличается более удлиненным телом без выраженного щетинкового покрова, удлиненным плеотельсоном, укороченными шипами на стернитах IV–VII, пропорциями члеников антенны I, менее выраженной лопастью исхиоподита переопода III.*M. medioxima* sp.n. (8°21,2′с.ш., 56°17,4′в.д.; 4458 м) достаточно четко отличается от близких *M. capito* Mezhov, 1989 и *M. amplinexa* Mezhov, 1989 заметно менее выраженным щетинковым покровом тела, отсутствием шипов и медиальным килем стернальной поверхности переднего отдела переона. *M. prolix*a sp.n. (8°21,2′с.ш., 56°17,4′ в.д.; 4458 м) несколько напоминает внешне *M. urceolata* Mezhov, 1989, но отличается сравнительно расширенным телом, округленно-прямоугольным плеотельсоном, зубцами на стернитах IV и V, относительно укороченными антеннами I с меньшим количеством эстетасков, короткими антеннами II, более узким эпиподитом ногочелюсти, массивной лопастью исхиоподита переопода III, практически прямым экстеролатеральным краем плеопода I, узким протоподитом плеопода II с более многочисленными дистальными щетинками.*M. minuscularia* sp.n. (17°35′ с.ш., 64°09′ в.д.; 3617 м) довольно близок *M. sensitiva* Birstein, 1970, от которого отличается сравнительно малыми размерами, более удлиненным телом, удлиненной головой, расширенным дистально плеотельсоном с сильно укороченной медиодистальной лопастью, совершенно другими пропорциями члеников антенны I, строением переопода III, относительно узким и притупленным дистально протоподитом плеопода II.

Seven isopod crustacean species of the genus *Macrostylis* G.O. Sars, 1864 are known from the Indian Ocean: six abyssal species (three from the northwestern

Table 1. Collecting stations.
Таблица 1. Станции сбора материала.

No. of station	Gear	Coordinates		Depth, m
		N	E	
4720	BS	17°35'	64°09'	3617
4799	BS	8°21.2'	56°17.4'	4458

Gears: ST — Sigsby Trawl, BS — bottom sampler "Okean".

part of the ocean, two from the northern part and one from the northern and central parts) and one ultraabyssal species from the Java Trench [Mezhov, 1988, 1989]. The results of the studies of macrostylid material from the R/V "Vityaz " collections (voyages 31 and 33) in a northwestern part of the Indian ocean have expanded this list. Four species of*Macrostylis*, all from the abyssal zone, are new to science and described herein. The basic station data are summarized in Table 1. Type specimens of all new species are deposited in the Zoological Museum of the Moscow State University (ZMMU).

Macrostylis confinis **sp.n.**
Tab. 1, Fig. 1.

MATERIAL. Holotype — ♀ without oostegites, 2.7 mm long (ZMMU Mc-1361), station 4720. Paratypes: ♀ with empty marsupium, 2.2 mm long and 2 juvenile ♂♂ 0.95 mm and 1.1 mm long (ZMMU Mc-1362), station 4720.

DESCRIPTION. Female 2.7 mm long. Maximal width of body 4.5 times less than length and 1.7 times greater than maximal width of pleotelson; body cuticle smooth and glossy, no macrosculpture and setation present.

Head semicircular, maximal width almost 1.5 times greater than length and 1.6 times greater than width of frontal margin; lateral surfaces uniformly convex; frontal margin widely rounded.

Anterior division of pereon almost quadrate, with slightly convex lateral surfaces; length 1.05 times less than maximal width; tergite I is equal in length to tergite III and 1.1 times longer than tergite II; sternal surface differentiated segmentally by shallow transversal grooves and with one long anterior and one short posterior spine.

Tergite IV with roundly convex lateral surfaces, length 2.1 times less than maximal width; posterolateral parts are tapered backwards, with distal bristles; sternite visible swelled, its posterior margin with a small caudally directed spine.

Tergite V 1.1 times shorter than tergite VI and 1.25 times longer than tergite VII; posterolateral parts of tergites V–VII with distal bristles; sternites V–VII with spines of average length directed backwards.

Pleotelson elongated, ovoid, one forth of total body length; maximal width 1.8 times less than length and 1.5 times greater than distal width; dorsal surface uniformly convex; posterolateral projections small and roundly angular; mediodistal lobe large, uniformly rounded; caudal organs distinctly visible, slot-like apertures transversal.

Antenna I consists of 5 articles, length ratios from basal to distal as 1 : 0.80 : 0.65 : 0.85 : 0.40; distal article with one aesthetasc of average length. Antennae II not saved.

Mandible with serrated cutting margin (more than three teeth) and movable plate (4 teeth); tooth row with 6–7 saw-tooth bristles; tooth process broad, conical, with 14 terminal bristles of tapered distal part. Epipodite of maxillipede approximately ovate to lanceolate, length 2.9 times more than maximal width; exterolateral margin significantly concave.

Ischiopodite of pereopod III elongate, triangular, length 1.8 times more than maximal width; lobe short, rounded to angular, with one direct thickened bristle of average length on top; combs of meropodite and carpopodite with 6 and 4 bristles accordingly. Ischiopodite of pereopod IV with widely and uniformly rounded convexity instead of lobe.

Operculum tongue-like, its maximal width 1.6 times less than length and 2.1 times more than width of distal end; distal margin roundly truncated, with 10 pinnate bristles of average length.

Uropods saved partially, as fragments of protopodites.

TAXONOMIC REMARKS. The new species differs from the closest related *M. amplinexa* Mezhov, 1989 by a more elongated body without setation, an elongated pleotelson, shortened spines on sternites IV–VII, differing proportions of articles of antenna I, less produced lobe of the pereopod III ischiopodite and the relatively broadened distal part of operculum.

ETYMOLOGY. From Latin *confinis* (adjacent); refers to the similarity to one of species.

DISTRIBUTION. North-western part of the Indian ocean (17°35′N, 64°09′E).

ECOLOGY. Abyssal zone, depth 3617 m, dense clayey silt, at bottom temperature 2°C; density 20 ind./m^2, biomass about 0.03 g/m^2.

Macrostylis medioxima **sp.n.**
Tab. 1, Fig. 2.

MATERIAL. Holotype ♀ without oostegites, 3.2 mm long (ZMMU Mc-1363), station 4799.

DESCRIPTION. Female 3.2 mm long; maximal body width 3.8 times less than length and 1.55 times more than maximal width of pleotelson; body cuticle smooth, dimly glossy, granulosity and macrosculpture not present; short hair-like setae on dorsolateral parts of tergites IV–VII and pleotelson.

Head semicircular, maximal width 1.25 times more than length and 1.75 times more than width of frontal margin; frontal margin with small excavation in medial third.

Anterior division of pereon rounded to rectangular, with poorly convex lateral surfaces, length almost 1.2 times more than maximal width; tergite I 1.25 times longer than tergite II and about equal in length to tergite III; sternal surface differentiated segmentally by shallow transversal grooves, with distinct low medial keel; spines not present, but there are two tubercles (large frontal and small distal).

Tergite IV distinctly broaden frontally, length 3.5 times less than maximal width; lateral surfaces roundedly convex, posterolateral part angular; sternite with single spine of average length.

Tergite V 1.2 times shorter than tergite VI and 1.05 times longer than tergite VII; posterolateral part of tergites V–VII subacutely tapered, with distal bristles.

Pleotelson broad, oviform, length almost 4.1 times less than common body length; maximal width 1.4 times less than length and 1.55 times more than distal width; dorsal surface evenly convex; posterolateral projections small, angular; mediodistal lobe large and roundly pointless; caudal organs visible, slot-like apertures diagonal.

Antenna I with 5 articles, length ratios from basal to distal as 1 : 0.55 : 0.40 : 0.45 : 0.20; distal article with one aesthetasc of average length. Antennas II not saved.

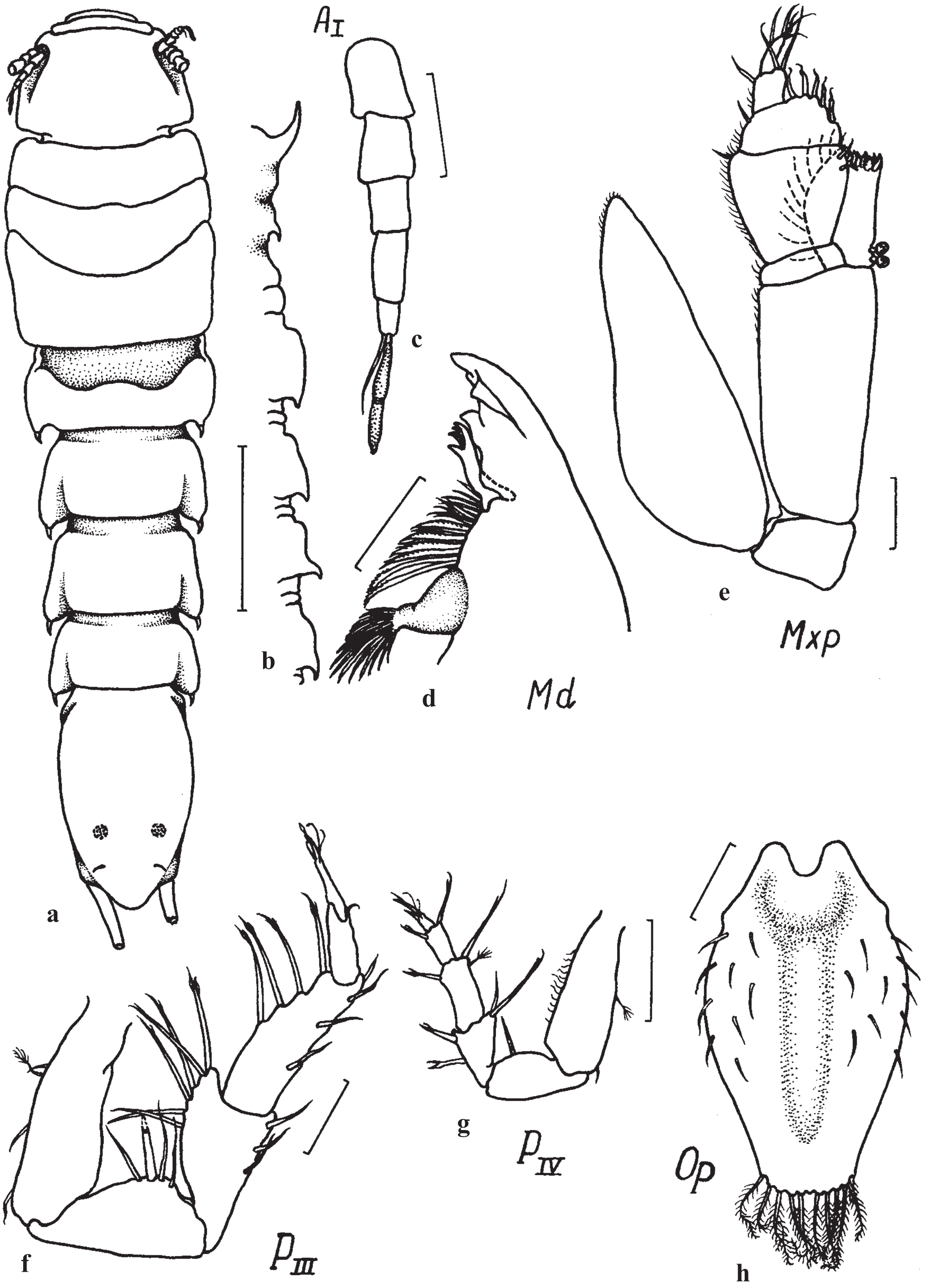


Fig. 1. *Macrostylis confinis* sp.n. Holotype female: total view from above (a), sternites from lateral side (b) and appendages (c–h). Scale bars: 0.5 mm (a, b), 0.05 mm (c–e) and 0.1 mm (f–h).

Рис. 1. *Macrostylis confinis* Mezhov, sp.n. Голотип самка: общий вид сверху (a), стерниты сбоку (b) и придатки (c–h). Масштаб 0,5 мм (a, b), 0,05 мм (c–e) и 0,1 мм (f–h).

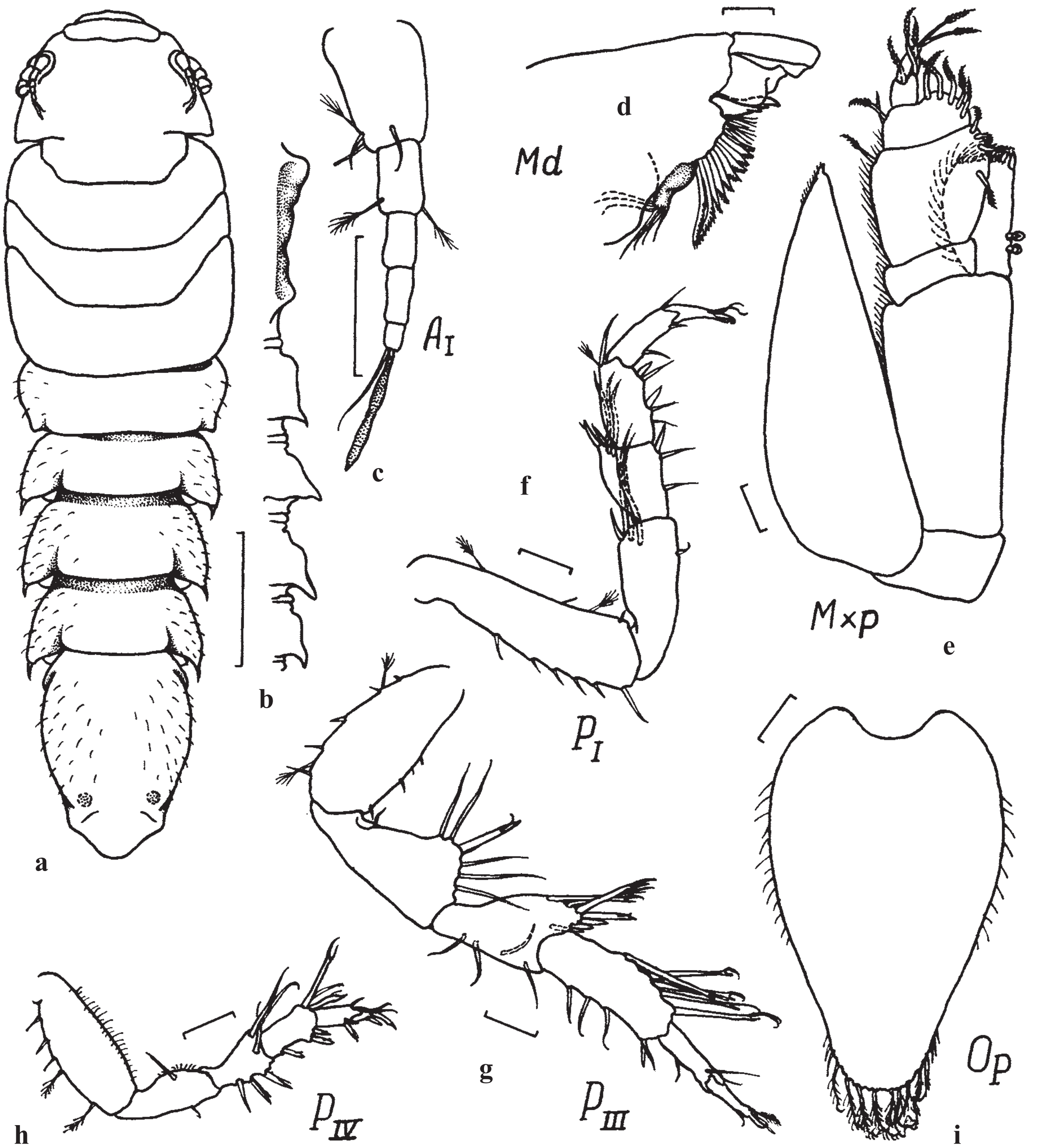


Fig. 2. *Macrostylis medioxima* sp.n. Holotype female: total view from above (a), sternites from lateral side (b) and appendages (c-i). Scale bars: 0.5 mm (a, b) and 0.05 mm (c−i).

Рис. 2. *Macrostylis medioxima* Mezhov, sp.n. Голотип самка: общий вид сверху (a), стерниты сбоку (b) и придатки (c−i). Масштаб 0,5 мм (a, b) и 0,05 мм (c−i).

Cutting margin of mandible tuberculate; movable plate with 3 or 4 teeth in one longitudinal row subapically; in tooth row 9–10 sawtooth bristles; tooth process one-sidedly swelled near basis, with widely tapered distal part and 7–8 bristles on its end. Epipodite of maxillipede blade-like, length 3.1 times more than maximal width; interolateral margin direct, exterolateral margin widely rounded.

Ischiopodite of pereopod III elongated, triangular, length 1.7 times more than maximal width; lobe rather large, angular, with one direct thickened bristle of average length on top; on combs of meropodite and carpopodite 7 (4 long and 3 short) and 5 long bristles accordingly. Ischiopodite of pereopod IV practically without lobe.

Operculum tongue-like, maximal width 1.5 times less than length and 3.5 times more than distal width; distal part slightly tapered, with 10 bristles of average length on the narrowly rounded end.

Uropods not saved.

TAXONOMIC REMARKS. Some external characters of the described species are similar to *M. capito* Mezhov, 1989 and *M. amplinexa* Mezhov, 1989. *M. medioxima* sp.n. differs especially from those species a much weaker setation of a body, the absence of spines and a medial keel on the sternal surface of the anterior division of the pereon (from *M. capito* the new species differs by proportions and relative sizes of head, and also the shape of the pleotelson).

ETYMOLOGY. From Latin *medioximus* (average), refers to the intermediate morphology among many other species of the genus *Macrostylis.*

DISTRIBUTION. North-western part of the Indian Ocean (8°21.2′N, 56°17.4′E).

ECOLOGY. Abyssal zone, depth 4458 m, soft clayey silt, temperature 1.6°C; density 5 ind./m^2, biomass about 0.005 g/m^2.

Macrostylis prolixa **sp.n.**

Tab. 1, Fig. 3.

MATERIAL. Holotype ♂, 3.0 mm long (ZMMU Mc-1364), station 4799.

DESCRIPTION. Male, 3.0 mm long. Maximal width of body 4.2 times less than length and 1.3 times more than maximal width of pleotelson; cuticle distinctly granulated, macrosculpture and setation not present.

Head rounded, maximal width 1.4 times more than length and approximately in as much more than width of frontal margin; lateral surfaces in main convex, with small proximal excavations; frontal margin is divided into three identical small convexities, derivated by two shallow narrow excavations on each side of medial third.

Anterior division of pereon keg-like, length almost 1.1 times more than maximal width; lateral surfaces poorly convex, anterolateral and posterolateral parts rounded; tergite I 1.1 times shorter than tergite II and 1.3 times shorter than tergite III; sternal surface differentiated segmentally by shallow transversal grooves, with large upright spines frontally and posteriorly.

Tergite IV inconspicuously broadened frontally, length three times is less than maximal width; posterolateral parts angularly subacute, with small distal bristles; sternite swelled, with short spine.

Tergite V 1.35 times shorter than tergite VI and almost 1.2 times longer than tergite VII; posterolateral parts of tergites V–VII visible tapered caudally, with distal bristles; sternite V with direct spine of average length directed downwards perpendicularly to body; sternites VI and VII with direct spines of average length directed inferocaudally.

Pleotelson rounded to rectangular, its length 4.2 times less than total length of body; maximal width 1.35 times less than length and practically is equal to distal width; dorsal surface uniformly convex, posterolateral parts widely rounded, mediodistal lobe short and rounded; caudal organs large and visible distinctly, slot-like apertures subtransversal.

Antenna I consists of 5 thickened articles, length ratios from basal to distal: 1 : 0.50 : 0.45 : 0.20 : 0.25; subapical and apical articles with 6 aesthetascs of average length everyone. Antenna II 4.1 times longer than antenna I and reaching tergite II, with six-articulated flagellum; rudiment of exopodite one-articulated.

Cutting margin of mandible smooth; movable plate with 4 denticles arranged in one longitudinal row subapically; tooth row includes not less than 8 sawtooth bristles; tooth process broad,conical, with 7–8 terminal bristles on the shortly tapered distal part. Maxilliped epipodite 3.3 times longer than maximal width; exterolateral margin with wide and rather deep excavation.

Ischiopodite of pereopod III irregularly triangular, length 1.2 times more than maximal width; lobe large, displaced to distal margin of ischiopodite; top of lobe distinctly inclined frontally, with short direct thickened bristle; combs of meropodite and carpopodite with 9 and 5 long bristles accordingly. The lobe of ischiopodite and comb of meropodite of pereopod IV essentially broadened, with 4 and 3 elongated bristles accordingly.

Exterolateral margin of pleopod I almost straight; distal margin beveled exterolaterally, with 5 short bristles; hyaline process short and hook-likely slightly curved frontally. Length of protopodite of pleopod II 3.6 times more than maximal width; distal margin widely rounded, with 11 long pinnate bristles; process of endopodite not reaching to distal margin of protopodite by needle-shape tapered end.

Uropod 1.2 times longer than pleotelson; protopodite 4.9 times longer than endopodite, with rather large exterodistal process.

TAXONOMIC REMARKS. The new species differs from the similar *M. urceolata* Mezhov, 1989 by a comparatively broadened body, a rounded to rectangular pleotelson, spines on sternites IV and V, a relatively shortened antenna I with fewer aesthetascs, shorter antenna II, narrower epipodite of maxilliped, massive lobe of ischiopodite of pereopod III, practically direct exterolateral margin of pleopod I, narrow protopodite of pleopod II with more numerous distal bristles, together with some other details of morphology.

ETYMOLOGY. From Latin *prolixus* (stumpy), refers to the the bulky habitus.

DISTRIBUTION. North-western part of the Indian Ocean (8°21.2′N, 56°17.4′E).

ECOLOGY. Abyssal zone, depth 4458 m, soft clayey silt, temperature 1.6°C; density 5 ind./m^2 and biomass about 0.005 g/m^2.

Macrostylis minuscularia **sp.n.**

Tab. 1, Fig. 4.

MATERIAL. Holotype ♂, 1,5 mm long (ZMMU Mc-1365), station 4720.

DESCRIPTION. Male, 1.5 mm long. Maximal width of body 5.6 times less than length and 1.4 times more than maximal width of pleotelson; cuticle of body distinctly granulated, no macrosculpture and setation.

Head narrow, trapezoidal, maximal width 1.1 times less than length and 1.4 times more than width of frontal margin; distal thirds of lateral surfaces are slightly concave; medial third of frontal margin slightly excavate.

Anterior division of pereon subrectangular, length 1.1 times more than maximal width; lateral surfaces practically direct, anterolateral parts rounded, posterolateral — angular; tergites approximately identical in length; sternal surface differentiated segmentally by deep transversal grooves, with large frontal spine and angular distal projection.

Tergite IV distinctly broaden frontally, length 2.5 times less than maximal width; lateral surfaces slightly concave; sternite with large spine directed caudally.

Tergite V 1.2 times shorter than tergite VI and 1.1 times shorter than tergite VII; posterolateral parts of tergites V–VII



Fig. 3. *Macrostylis prolixa* sp.n. Holotype male: total view from above (a), sternites from lateral side (b) and appendages (c–k). Scale bars: 0.5 mm (a, b), 0.05 mm (c–f) and 0.1 mm (g–k).

Рис. 3. *Macrostylis prolixa* Mezhov, sp.n. Голотип самец: общий вид сверху (a), стерниты сбоку (b) и придатки (c–k). Масштаб 0,5 мм (a, b), 0,05 мм (c–f) и 0,1 мм (g–k).

angularly tapered, with distal bristles; sternites V and VII with short spines, sternite VII with large spine directed caudally.

Pleotelson elongated, campanulate, on fifth of body length; maximal width 1.8 times less than length and practically equal to distal width; dorsal surface straightened, lateral surfaces uniformly convex; posterolateral projections large, angular; mediodistal lobe very short and widely rounded; caudal organs visible distinctly, slot-like apertures transversal.

Antenna I large, reaching tergite I and consists of 5 articles, lenght ratios from basal to distal:1 : 0.15 : 0.10 : 0.30 : 0.05; on 3, 4 and 5 articles 8 long aesthetascs. Antenna II 3.2 times longer than antenna I and reaching tergite V; flagellum consists of 7 articles, rudiment of exopodite one-articled.

Mandible with serrated cutting margin with at least 3 angularly subacute teeth; movable plate at least with 4 small denticles arranged in one row subapically; tooth row with at

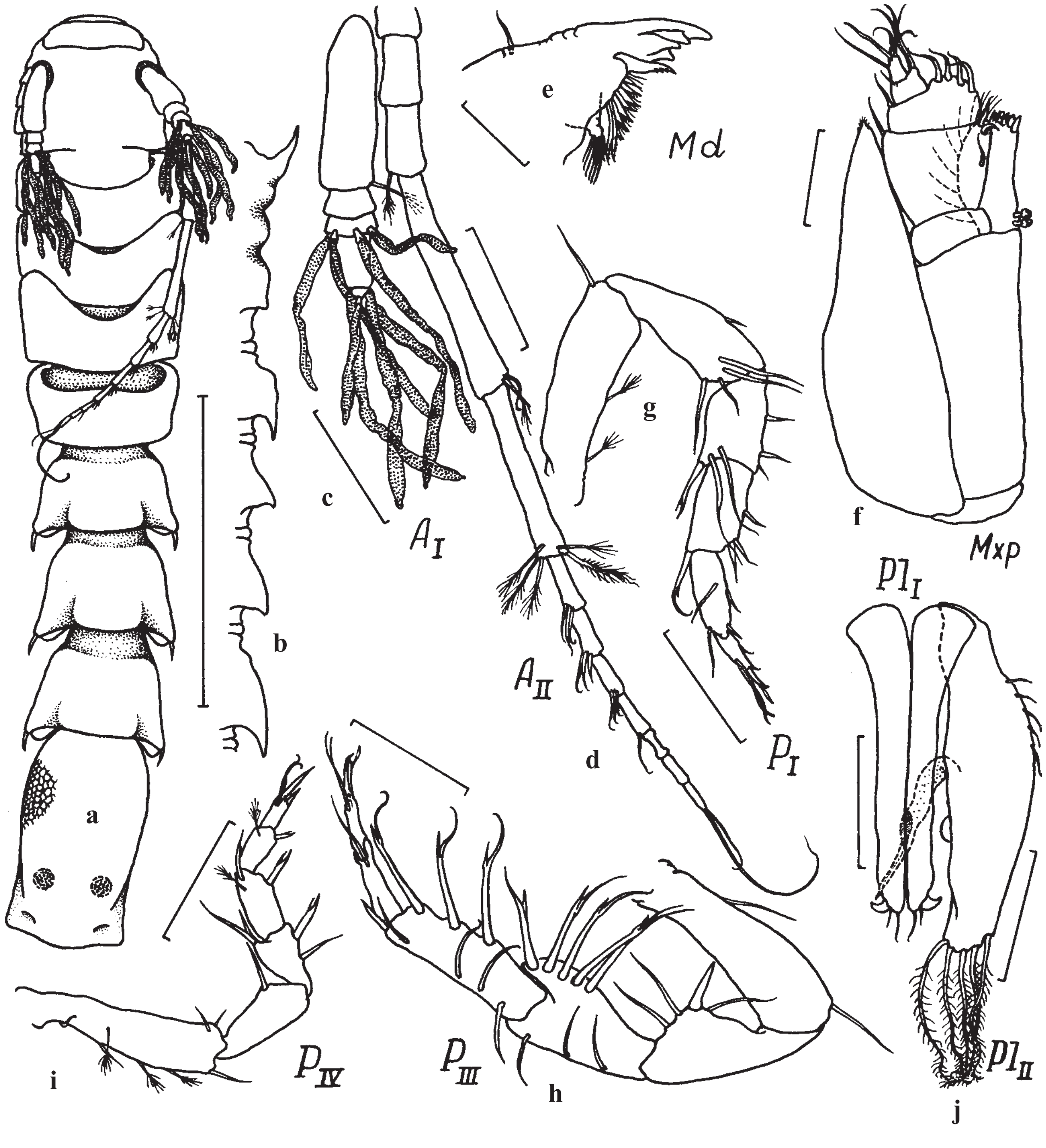


Fig. 4. *Macrostylis minuscularia* sp.n. Holotype male: total view from above (a), sternites from lateral side (b) and appendages (c–k). Scale bars: 0.5 mm (a, b) and 0.05 mm (c–k).

Рис. 4. *Macrostylis minuscularia* Mezhov, sp.n. Голотип самец: общий вид сверху (a), стерниты сбоку (b) и придатки (c–k). Масштаб 0,5 мм (a, b) и 0,05 мм (c–k).

least 8 sawtooth bristles; tooth process broad, conical, with 7 terminal bristles of average length on shortly tapered distal part; on place of palp there is bristle. Proximal half of maxilliped's epipodite with almost parallel interolateral and exterolateral margins, distal half angularly subacute; length of epipodite 3.35 times more than maximal width.

Ischiopodite of pereopod III elongated, triangular, length twice more than maximal width; lobe widely angular, with one short direct thickened bristle on top; in combs of meropodite and carpopodite 5 and 3 bristles accordingly.

Pleopod I with 2 bristles of average length on beveled exterolaterally distal margin; hyaline process relatively large, hook-like and prominents exterolaterally. Protopodite of pleopod II is elongate-lanceolate, its length 3.8 times more than maximal width; roundedly pointless distal margin with 5 long pinnate bristles; prominent part of endopodite with needle-shape tapered distal end, which does not reach the distal margin of protopodite.

Uropods not saved.

TAXONOMIC REMARKS. The new species differs from the rather closely related *M. sensitiva* Birstein, 1970 by the following main characters: comparatively small size, more elongated body, elongated head, broadened distally pleotelson with strongly shortened mediodistal lobe, distinctly different proportions of articles of antenna I, structure of pereopod III, relatively narrow and blunt distal protopodite of pleopod II.

ETYMOLOGY. From Latin *minuscularius* (small).

DISTRIBUTION. North-western part of the Indian Ocean (17°35′N, 64°09′E).

ECOLOGY. Abyssal zone, depth 3617 m; dense clayey silt, temperature 2°C; density 5 ind./m^2 and biomass about 0.005 g/m^2.

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